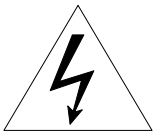
1 Channel Video Stabilizer

ZS-STB1000

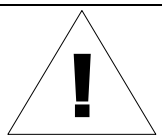
User's Manual

INFORMATION TO USER

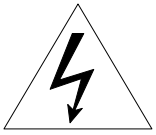


CAUTION

RISK OF ELECTRIC SHOCK,
DO NOT OPEN



CAUTION: TO REDUCE THE RISK OF ELECTRIC SHOCK,
DO NOT REMOVE COVER (OR BACK).
NO USER SERVICEABLE PARTS INSIDE.
REFER SERVICING TO QUALIFIED SEERIVCE PERSONEL.



This symbol is intended to alert the user to the presence of un-insulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.

This symbol is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

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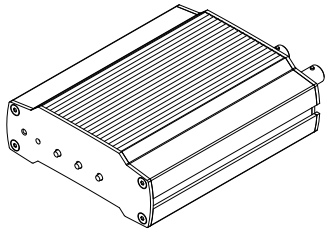
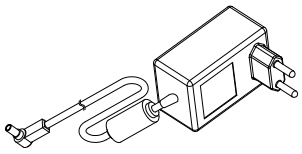
1. PACKAGE CONTENTS

Unpack carefully and handle the equipment with care. The packaging contains:

Stabilizer



DC power adaptor



Note

The above contents are subject to change without prior notice.

2. INTRODUCTION

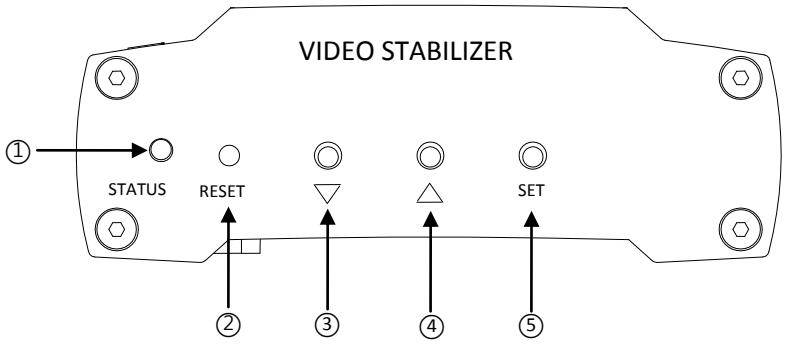
The Video Stabilizer utilizes advanced Digital Image Stabilizing algorithms to minimize the effects of camera shake. These algorithms have been optimized to run in real-time on a dedicated digital media processor that fits inside a box that can rest on the palm of your hand.

The video stabilizer has been designed to be totally plug-and-play, meaning you can get started simply by plugging in and switching on.

This manual will help you get your video stabilizer up and running quickly, as well as lead you through some of the advanced options provided by this unit.

2.1. Part Name

2.1.1. Front Panel



① **Status LED**

This LED is located on the left side of the front panel and indicates certain system information.

Device Status	LED Indicator
Power off	Off
In booting	Yellow On (Sometimes "*Red On"* for a short time)
Not stabilizing	Green Blinking 1Hz
Stabilizing	Green On
Malfunction	Red Blinking 1Hz

② **Reset**

The reset switch is used for resetting device to Factory Default settings. Refer to section "***4.7. Restore Defaults***" for more specific information.

③ **Down Button**

Navigate through menus on the screen.

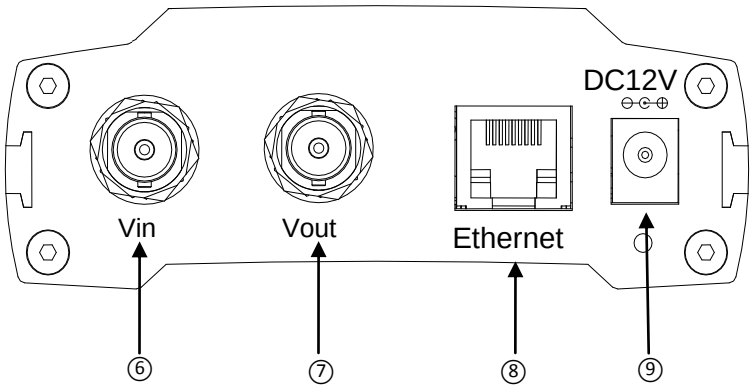
④ **Up Button**

Navigate through menus on the screen.

⑤ **SET Button**

Opens the setup menu or select and confirm the input.

2.1.2. Back Panel



⑥ **Video Input BNC connector**
The video input connector, connect to the camera.

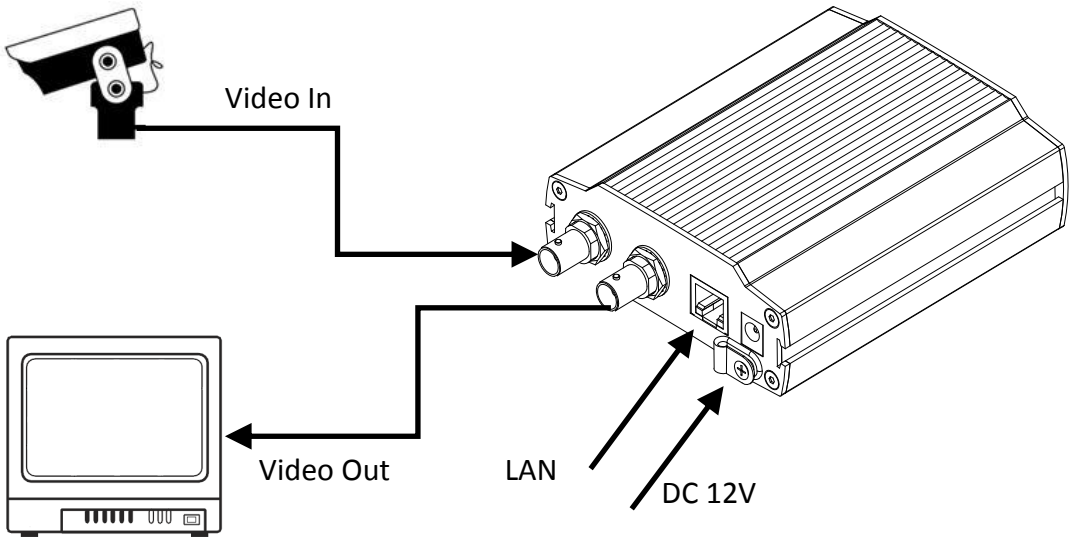
⑦ **Video Output BNC connector**
The video output connector, connect to a device such as a VCR or monitor.

⑧ **LAN Connector (Ethernet)**
This is a RJ45 LAN connector for management.

⑨ **Power Adaptor Connector (DC 12V)**
The device needs a DC 12V adapter for power supply.

3. CONNECTION

3.1. Connectors



The video stabilizer is intended to be connected in-line between the video source and the video display.

Connect the power to the unit with the supplied power adaptor. Your video stabilizer should now be operational and stabilizing video. There is no need to perform any other set up.

In the event of a power failure to the video stabilizer unit, the video will pass through the unit un-stabilized.

The Ethernet connection is only for firmware update. (Refer to section "***5.3.2. How to Update*** the "). It can also be used to control advanced configuration parameters (Refer to section "***4. CONFIGURATION*** 오류! 참조 원본을 찾을 수 없습니다. ") but is not required to get started.

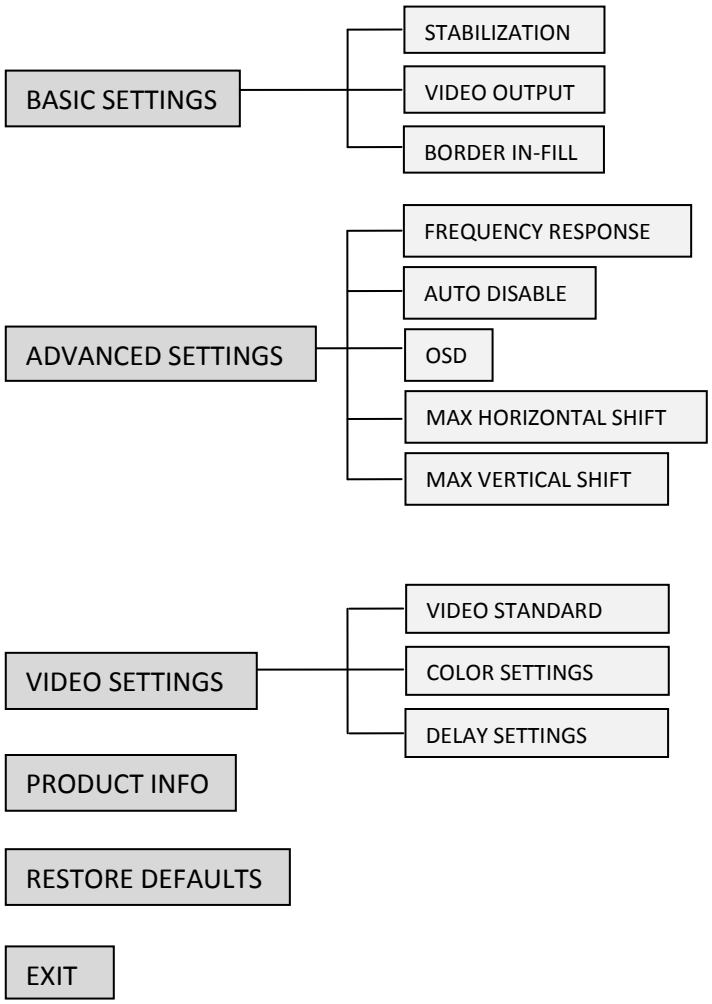
Note

The stabilizer takes about 1 minute to start operating. During the start-up time the stabilizer remains in loop-through mode.

4. CONFIGURATION

Your stabilizer unit is shipped with the default options configured at the factory. The default options are suitable for most applications, but some installations may warrant slightly different configuration. The following section details how to change the parameters from the default settings, and the effect that they have.

4.1. Setup Menu



4.2. How to Change the Settings

The configuration parameters can be controlled by the buttons on the front panel. To access the SETUP menu on the device, press the SET button on the front panel. You can navigate the menus using the Up/Down buttons.
The parameters can also be configured by connecting the unit to a PC (via an Ethernet switch, or a crossover cable), and accessing the device from a web browser. Most of the functions on the webpage work the same as the ones on the front panel button.

4.3. Basic Settings

4.3.1. Stabilization Mode

The stabilization mode has 2 options:

- On: [Default] Stabilization is enabled.
- Off: Stabilization is disabled (video pass through).

4.3.2. Video Output

The video output mode has 2 options:

Full Screen	**[Default]** The output signal is the full-screen stabilized version of the input signal.
Split Screen	The output signal consists of 50% un-stabilized, and 50% stabilized versions of the input signal, split vertically down the middle of the output. This mode is primarily used for demonstrating the effectiveness of the stabilization unit on a single monitor and would not normally be used in day-to-day operation.

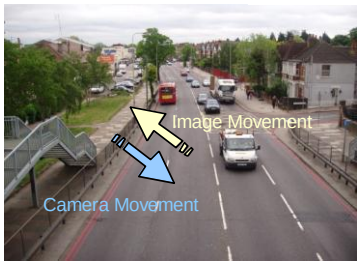
Full Screen Mode

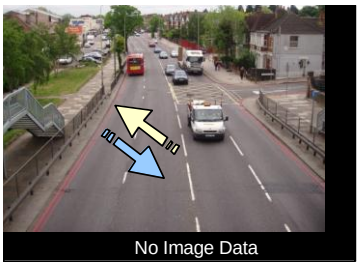
Split Screen Mode

<un-stabilized video> <stabilized video>

4.3.3. Border In-fill

In order to keep the output frames steady and aligned to a reference frame, the output frames are shifted with respect to the input frames. As the camera moves around, so the output frames are shifted to keep the image features aligned to previous frames. This results in areas for which there is no image data available:





The Border In-fill mode controls what happens to those areas that do not contain any image data. There are 4 options available:

Fast Fade	**[Default]** Newer frames are composited on top of older frames. The old frames are faded away to black quickly (see diagram). This mode is most suited to PTZ and fixed cameras.
Slow Fade	Newer frames are composited on top of older frames. The old frames are faded away to black slowly (see diagram).
No Fade	Newer frames are composited on top of older frames. The old frames are not faded away (see diagram). Suitable for fixed cameras where there is minimal movement by people and cars around the edge of the scene.
Fixed	A fixed size black border is present on all sides which blanks out the moving edges of the image (see diagram). The size of the borders is equal to the maximum frame shift. See Advanced Configuration.
None	Old frames are not displayed. Regions of the output image for which there is no available data are filled with black (see diagram).

Fast/Slow Fade

No Fade

Fixed

None

4.4. Advanced Settings

4.4.1. Frequency Response

The Frequency response Mode has 2 options:

Normal	**[Default]** The stabilization algorithm parameters are optimized to give the best stabilization results for the normal frequency movements.
Low Frequency (<1Hz):	This stabilization mode is designed to allow tracking of intentional camera panning by not stabilizing low frequency movements (< 1Hz). The Low Frequency mode has a lower cut-off frequency to allow better low frequency stabilization at the expense of worse tracking of intentional movement (see Attenuation vs Frequency graph on the last page). This mode will automatically switch to the higher frequency mode when excessive movement in one direction is detected in order to allow better tracking of intentional movement. Once this movement has stopped it will revert back to the low frequency mode.

4.4.2. Auto Disable

There are 2 options for Auto Disable - neither is selected by default:

Pan/Tilt	This option disables the stabilization when excessive pan or tilt motion is detected. This makes it easier to control pan/tilt cameras because the Stabilizer ceases to oppose operator pan/tilt commands above the threshold. Once panning stops, there is a 3 sec timeout period before stabilization is reactivated.
Low Detail	When this option is enabled, the algorithm is disabled when a scene with insufficient detail for reliable stabilization is detected. This prevents the image position 'hunting' when there is very little scene detail or features. For example, when the camera is pointed at a completely blank wall the stabilized image will jump around slightly because it is locking on to the random video noise. Similar hunting problems can occur in other situations where a large part of the scene lacks suitable detail for Stabilizer lock: • Other low contrast situations such as at night scenes. • Scenes with an absence of detail in one direction such as venetian blinds. • Scenes with a repeated pattern such as a brick wall.

Note

Enabling the Low Detail mode can result in the stabilization being disabled prematurely on low contrast or noisy video, which is why this mode is not enabled by default.

4.4.3. On-Screen Annotation

When this option is enabled, a message will appear on the screen whenever stabilization is disabled. It is not intended that On-Screen Annotation is permanently enabled. Generally, it should be used to help set up the Stabilizer in the following configuration situations:

- To see the effect of the Auto Disable pan/tilt and Auto Disable Low Detail functions.
- To see if the stabilization is being disabled because the camera motion is too fast.

4.4.4. Maximum Frame Shift

This is the maximum amount in image pixels that the algorithm will shift the frame horizontally and vertically in either direction from the normal position. Both horizontal and vertical shifts are settable in the range [24 – 256], the default is 128.

Usually the only reason to select low Frame Shift values is when the Border In-Fill is in Fixed mode because as the borders are increased in size the viewable image area gets smaller by the same amount.

Setting these values too low will prevent the algorithm from stabilizing properly. The lower the setting the less stabilization range is possible.

4.5. Video Settings

4.5.1. Video Standard

Select between NTSC and PAL video standards.

4.5.2. Color Settings

Change the Brightness, Contrast, Hue, Saturation and Sharpness of the video.

4.5.3. Delay Settings

Change the vertical and horizontal capture delay of the video. These settings affect the vertical and horizontal position of the displayed image, allowing the black borders to be equalized on either side and top and bottom of the image. (This adjustment may be necessary because some analogue video signals do not conform exactly to the blanking timing of the video standard and consequently a black stripe may be visible on one side of the image.)

Note

Set Border in-fill to 'none' when adjusting the Delay Settings so that the effect of the horizontal and vertical delay can be seen clearly.

4.6. Product Info

Display the Product information as below.

- IP Address
- Subnet
- MAC Address
- Serial number
- Firmware version

4.7. Restore Defaults

Restore the configuration to the default values except the network configuration of the device.

If you want to restore the configuration including the network settings, you need to do the factory default setting by using the reset button.

- **Reset to Factory Default Settings**
  1. Disconnect the power supply from the device.
  2. Connect the power to the device with the Reset button pressed and held.
  3. Release the Reset button after 5 seconds.
  4. Wait for the system to reboot.

The factory default settings can be inferred as follows:

IP address:	192.168.xx.yy
Network mask:	255.255.0.0
Gateway:	192.168.0.1
User ID:	root
Password:	pass

5. NETWORK CONFIGURATION

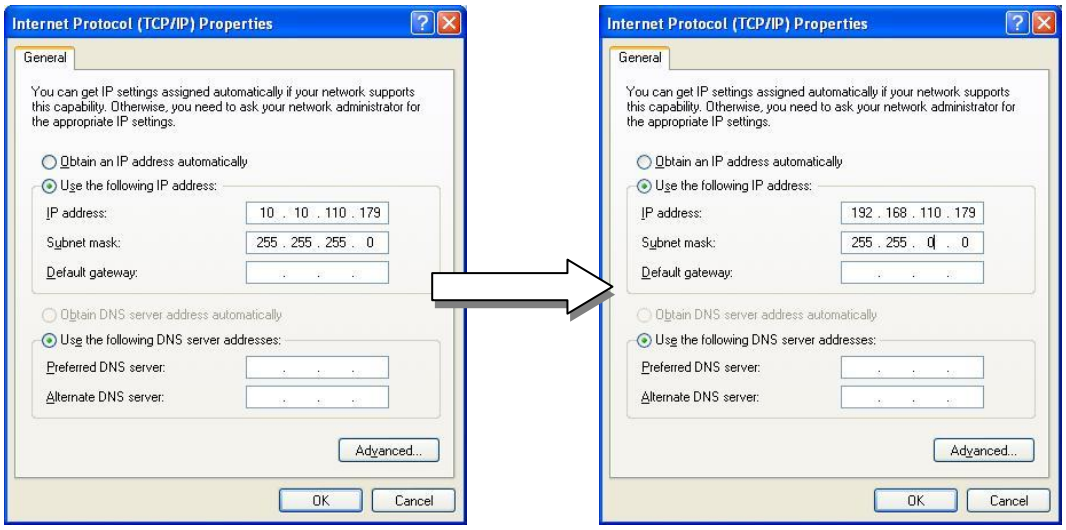
5.1. Network Connection

A network connection is needed for the firmware update and control of the advanced parameters.
The device is accessed by connecting the unit to a PC (via an Ethernet switch, or a crossover cable), and accessing the device from a web browser.

Before the device can be accessed from a web browser, the default IP address must be established.

The default IP address of your IP device is 192.168.XXX.XXX, where XXX.XXX depends on the MAC address of the device. You can determine the correct IP address from the MAC address of your device. You can also find the IP address from the PRODUCT INFO menu on the OSD.
Please make sure that the device and your PC are on the same network segment before running the installation. If the network segment between your PC and the device is different, change your PC's settings as below.

IP address : **192.168.xxx.xxx**
Subnet mask: **255.255.0.0**

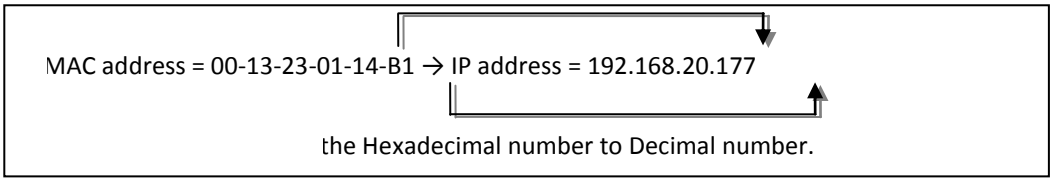

Internet Protocol (TCP/IP) Properties
General
You can get IP settings assigned automatically if your network supports this capability. Otherwise, you need to ask your network administrator for the appropriate IP settings.
Obtain an IP address automatically
Use the following IP address:
IP address: 10 . 10 . 110 . 179
Subnet mask: 255 . 255 . 255 . 0
Default gateway:
Obtain DNS server address automatically
Use the following DNS server addresses:
Preferred DNS server:
Alternate DNS server:
Advanced...
OK
Cancel
Internet Protocol (TCP/IP) Properties
General
You can get IP settings assigned automatically if your network supports this capability. Otherwise, you need to ask your network administrator for the appropriate IP settings.
Obtain an IP address automatically
Use the following IP address:
IP address: 192 . 168 . 110 . 179
Subnet mask: 255 . 255 . 0 . 0
Default gateway:
Obtain DNS server address automatically
Use the following DNS server addresses:
Preferred DNS server:
Alternate DNS server:
Advanced...
OK
Cancel

You can also change the network configuration of the device with IPAdminTool. For more information regarding IPAdminTool, please refer to section "***5.3. IPAdminTool***"오류! 참조 원본을 찾을 수 없습니다..

5.2. Connecting to the Device via LAN

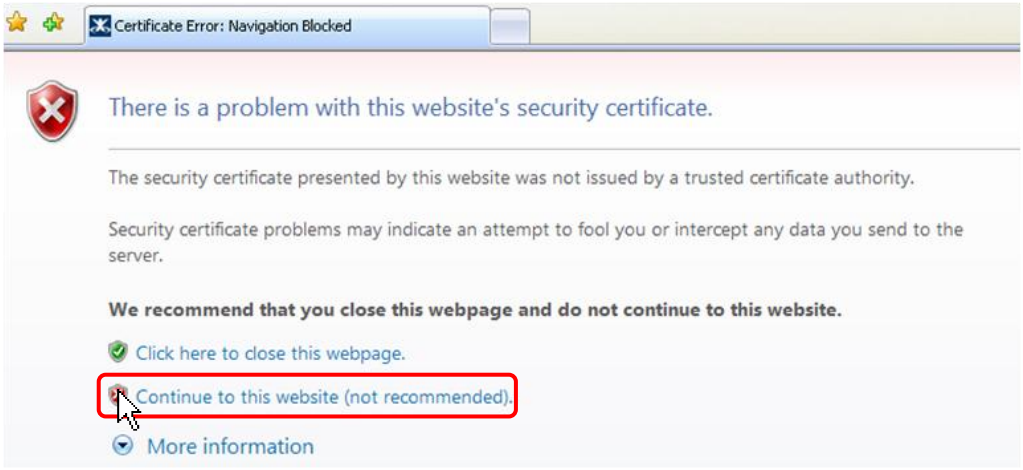
View the web page using your IP device and its IP address. To determine the correct IP address and use it to access the device, use the following steps:

1. Convert the MAC address to an IP address or check the IP address on the IPAdminTool. The MAC address is displayed on a label attached on the side or bottom of the device.

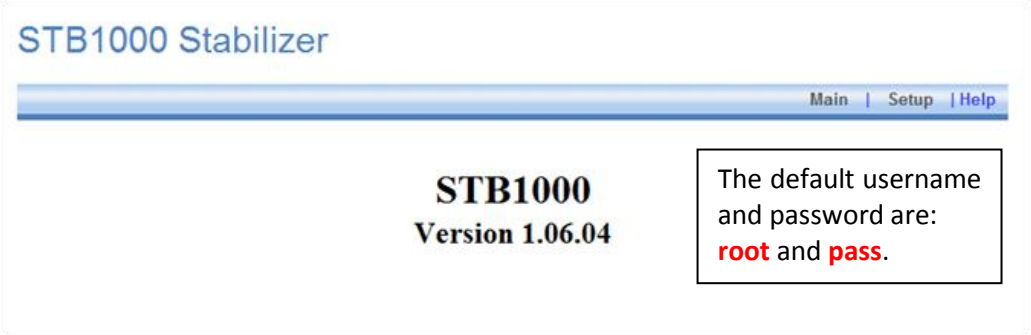


2. Open a web browser and enter the IP address of the device.

3. Click **Continue to this website** on the Security Certificate Alert page.
   (The explanation and captured images at this manual are mainly on the basis of Internet Explorer 7.0)


Certificate Error: Navigation Blocked
There is a problem with this website's security certificate.
The security certificate presented by this website was not issued by a trusted certificate authority.
Security certificate problems may indicate an attempt to fool you or intercept any data you send to the server.
We recommend that you close this webpage and do not continue to this website.
Click here to close this webpage.
Continue to this website (not recommended).
More information

4. Click **Setup** link to access the configuration page. Remember the default username and password are root and pass, respectively.



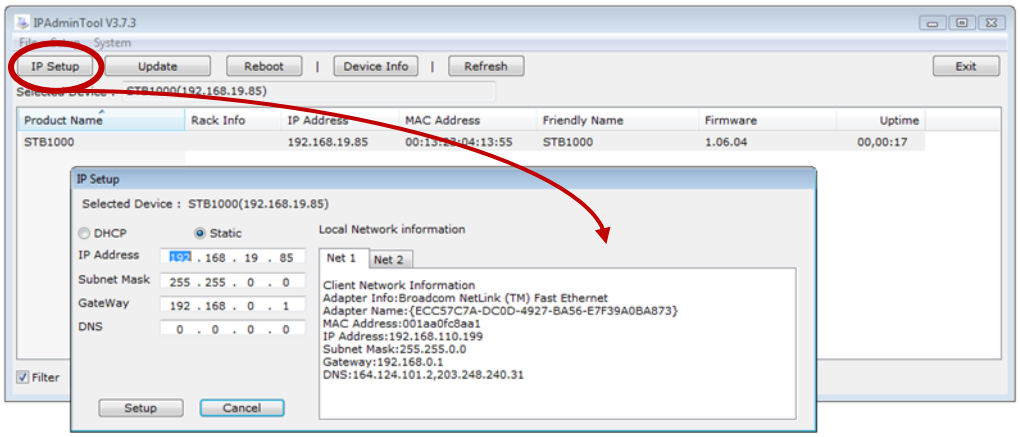
5.3. IPAdminTool

IPAdminTool automatically searches all activated devices and shows the IP address, MAC address and other relevant information. You can change the network configuration and update the device's firmware with this tool. IPAdminTool is provided with the SDK in the following SDK path.

{SDK root}\BIN\TOOLS\AdminTool\

5.3.1. How to Manage the Network Settings

You can adjust the network settings with IPAdminTool. Go to IP Setup button on the upper menu bar or you can use the shortcut menus as well.



DHCP

Let the DHCP server get the IP address automatically.

Static

Set the IP address, Subnet Mask, Gateway and DNS manually according to users' network requirements.

5.3.2. How to Update the Firmware

1. Select the device you want from the list: it will be highlighted in blue. Right-click it and select the 'Update' menu. You can see the window below and the selected devices are listed.
2. Now, if you have completed listing the devices you want to update, click the *Browse* button and select the firmware file (File format : *.pkt).
3. Click the *Update* button.
4. It is necessary to authenticate against the device. Type the ID and password of administrator authentication. The factory default is root(ID) and pass(pw).
5. Wait for a few seconds and the progress bar will indicate the current status of the update. When the update process is completed, the '*All update finish*' message box is shown.
6. After the completion of the firmware update, you should wait for about 1 minute while the device restarts. After completion of the update and reboot of the system, if the device is

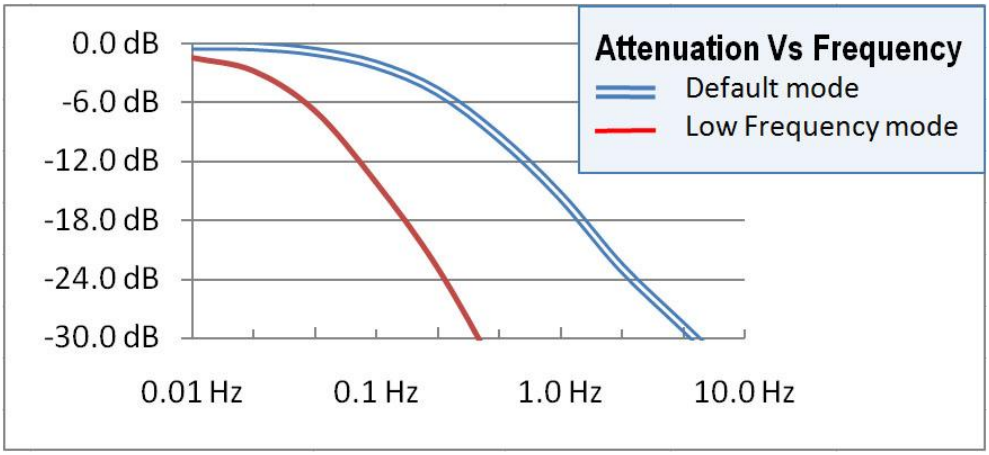
not shown on the scanned list of IPAdminTool, click the ‘Refresh’ button or try to type the IP address in Internet Explorer’s address bar.

APPENDIX (A): SPECIFICATION

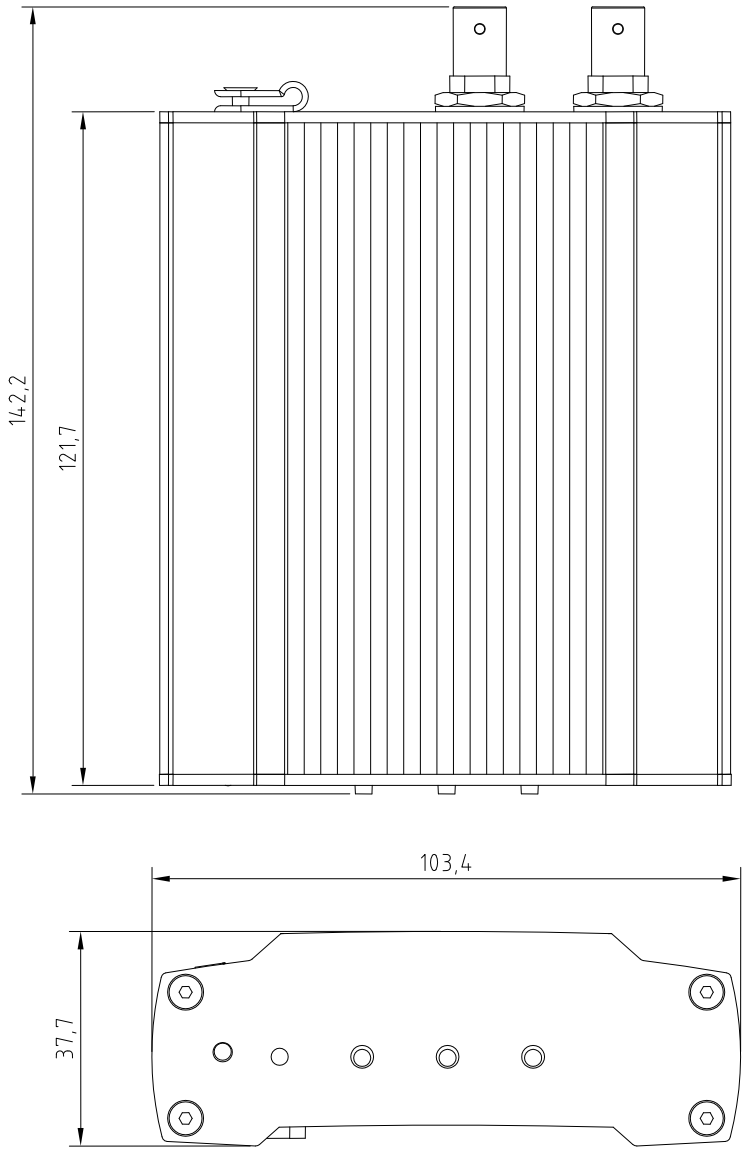
Summary

Stabilization	
Stabilization tracking rate	Approx ±3000 pixels/sec.
Stabilization range	Variable up to ±256 pixels
Stabilization frequency	0.1-30Hz (see graph*)
Video delay	< 80 ms.
Stabilization	X-Y movement at sub-pixel accuracy.
Automatic algorithm	Locks on to background features. Ignores moving objects and burnt-in text
Border	Image in-fill. Removes distracting image border movement by using in-filling data from previous frames.
Lock-on time	< 80ms from change of image.
Video	
Video Input	Composite, BNC connector.
Video Output	Composite, BNC connector.
Video standards	PAL/NTSC selectable
Video loop-through	Automatic loop-through when power is off and during start-up
D1 resolution digitization	720 x 576 PAL, 720 x 480 NTSC
Function	
Plug and Play	Works straight out of the box. Simply connect it in- line between camera & monitor
Start-up time	About 1 minute – Stabilizer remains in loop-through mode while the Linux Operating System starts
Configuration	Web browser interface for configuration of advanced modes
Network	Ethernet 10/100 Mbps (For firmware Update & Remote Set up)
Environmental	
Operating Temperature	0 ℃ ~ 60 ℃ (32 ℉ ~ 140 ℉)
Operating Humidity	Up to 85% RH (Non-condensing)
Electrical	
Power Source	12V DC (DC Jack)
Power over Ethernet	Not Available
Power consumption	260mA @ +12V
Mechanical	
Dimension	103(W) x 38(H) x 142(D) mm
Weight (Approx)	430g

Frequency Response Graph



APPENDIX (B): DIMENSION



(Unit: mm)

APPENDIX (C): TROUBLE SHOOTING

Checking your Firmware

Firmware is software that determines the functionality of the device. One of your first actions when troubleshooting a problem should be to check the currently installed version. The latest version may contain a correction that fixes your particular problem. The current firmware version in your device can be seen in PRODUCT INFO on the OSD or Main menu on the webpage.

New firmware can be downloaded from the FTP site. When you download firmware from the FTP, your product will receive the latest available functionality. Always read the upgrade instructions and release notes available with each new release, before updating the firmware. Please contact us to get an FTP account.

Support

If you cannot resolve an issue, for additional assistance please contact your supplier or system integrator or go direct to our Technical Support Team.

Troubleshooting

Problem	Solution
The video output is not stabilized for about 1 minute after connecting the power supply.	This is quite normal – the unit remains in loop-through mode while the internal Linux Operating System boots-up. The loop-through mode ensures that no video loss is incurred during this time.
The video is not synchronizing	Make sure the correct video standard is selected (NTSC or PAL) on the Video Settings page of the Web browser interface.
Sometimes the image jumps about and does not 'lock on properly'	The stabilizer cannot find any features in the image to lock on to or the features repeat (brick wall) or lack detail in a particular direction (venetian blinds). Stabilization can be suppressed in these cases by selecting the Auto Disable – Low Detail option on the Advanced Configuration page.
The stabilization is not very good with slow camera sway	The default stabilization algorithm does not suppress slow movement to allow tracking of intentional PTZ (Pan/Tilt/Zoom) movements. (See frequency response graph in the specification). Selecting 'Slow Stabilization' mode in the Camera Installation settings on the Advanced Configuration page will improve low frequency stabilization but will make

	PTZ tracking performance worse.
Sometimes incorrect data can be seen in the border area	When border infill is enabled, blank areas of the image left by the stabilizer shifting the image are filled in with old image data. Sometimes this does not match well with the live part of the image. This is especially apparent when the camera is panning and old data is left for a long time. Disable border infill if this is causing distraction by selecting 'None' or 'Fixed' from the Border Infill setting on the Basic Configuration page.
The image is not being stabilized properly	Make sure the Maximum Frame Shift settings are not set too small. For example, if the camera shake is causing the image to move up and down by 50 pixels but the Maximum Vertical Frame Shift is set to 32 pixels, the algorithm will not be able to stabilize the image properly.
The picture jumps around during fast panning	Try enabling Auto Disable – Pan/Tilt on the Advanced Configuration page. This will suppress stabilization when fast Pan/Tilt motion is detected.
The unit is exhibiting strange behavior	Try restoring the factory defaults.

REVISION HISTORY

MAN#	DATE(M/D/Y)	Comments
01A.01	12/11/2009	Created
01A.02	11/09/2010	Reviewed
01A.03	12/22/2010	Modified information about the LED indicator